

# Algae of Vidarbh, Maharashtra<sup>1</sup>

N. D. KAMAT<sup>2</sup>

Botany Department, Institute of Science, Nagpur 1

In this paper 636 taxa belonging to Chlorophyceae, Euglenophyceae, Xanthophyceae, Dinophyceae and Cyanophyceae are recorded from 25 different places in Vidarbh.

During the years 1964 to 1969, I collected 2538 vials of algae from Khamgaon, Mehkar and Lonar (Buldhana District), Akola, Karanja and Malegaon (Akola District), Amravati (Amravati District), Yeotmal (Yeotmal District), Pavnar, Wardha (Wardha District), Katol, Satnavri, Vena Dam, Dahegaon, Umred and Mansar (Nagpur District), Gondia, Tumsar, Tiroda, Bhandara Road, Bhandara, Jawahar Nagar and Sakoli (Bhandara District), Warora and Chandrapur (Chandrapur District). The collections were made mainly from ponds and lakes used for pisciculture. All these collections were preserved in 4% formalin. Camera lucida diagrams of all these algae have been drawn.

Vidarbh region consisting of eight districts, forms the north-eastern part of Maharashtra State. The maximum and minimum temperatures for the region are 50°C and 8°C. The rainfall varies from 70 to 125 cm for the different places of collections. The soil is mostly black and clayey.

So far *Chara brachypus* Br., *C. corallina* Willd., *C. zeylanica* Willd., *Lychnothamnus barbatus* (Meyen) Leonhardi and *Nitella hyalina* (De Cond.) Agardh from Ambazari lake, Nagpur (Kamat 1967) and *Pediastrum boryanum* (Turpin) Meneghini, *P. tetras* (Ehr.) Ralfs and *Tetraedron minimum* (A. Br.) Hansgirg from ponds in Nagpur (Philipose 1967) have been recorded from this region.

In this paper 391 taxa of Chlorophyceae, 96 taxa of Euglenophyceae, 2 taxa of Xanthophyceae, 11 taxa of Dinophyceae and 136 taxa of Cyanophyceae are included. Members of Charophyceae and Bacillariophyceae and the algae of Nagpur proper are still under study and hence not included in this paper. Many algae could not be identified for the lack of mature reproductive parts.

Rich collections were made from Vadali lake at Amravati and Ram-

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<sup>2</sup> Present address: Botany Dept., Institute of Science, Aurangabad.

sagar lake at Tiroda while very few algae were found in Januna lake at Khamgaon and Rishi lake at Karanja. The algal flora was negligible in ponds with a dense floating vegetation particularly of species of *Azolla*, *Wulfia*, *Lemna* and *Pistia* occurring either alone or in combinations.

The pH of the water of the collection spots when studied, is given in the bracket immediately after the collection spot. The pH was found out by studying at least three samples of water from three different places of the collection spot, by using B.D.H. Universal indicator. The pH of the collection spots ranged from 7.2 in Ramsagar to 11 in a lake at Lonar.

Common algae of this region are *Coelastrum cambricum* Archer v. *intermedia* (Bohlin) G. S. West, *Ankistrodesmus falcatus* (Corda) Ralfs, *Scenedesmus bijuga* (Turpin) Lagerh. v. *alternans* (Reinsch) Hansg., *Rhizoclonium hieroglyphicum* (Ag.) Kuetz., *Pithophora oedogonia* (Mont.) Wittr., *Closterium diana* Ehreb., *Cosmarium auriculatum* Reinsch, *Euastrum spinulosum* Delp., *Trachelomonas hispida* (Perty) Stein em. Defl., *T. volvocina* Ehrenb., *Aphanothece pallida* (Kuetz.) Rabenh., *Merismopedia glauca* (Ehrenb.) Naeg., *Spirulina major* Kuetz. ex Gomont, *Oscillatoria okeni* Ag. ex Gomont and *O. splendida* Grew ex Gomont.

Only the important works referred for the identification of these algae are given in the references.

#### CHLOROPHYCEAE

##### **Chlamydomonas globosa** Snow

In a puddle, Amaravati (18-10-64). In a pond (8.2), Katol (8-12-68).

##### **C. snowii** Printz

In a small pond, Akola (16-10-68).

##### **Gonium pectorale** Muell.

In a pool, Khamgaon (13-10-67). In Mendhe lake (9.5), Bhandara (19-10-68). In Abkari lake (7.5), Bhandara (9-12-68).

##### **Pandorina morum** (Muell.) Bory

In ponds, Umred (30-11-64), Mansar (13-12-64). In pools, Amravati (18-10-68). In Mendhe lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

##### **Eudorina elegans** Ehrenberg

In Abkari lake (7.5), Bhandara (28-12-68).

##### **Sphaerocystis schroeteri** Chodat

In Abkari lake (7.5), Bhandara

(29-11-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

##### **Gloeoecystis ampla** (Kuetz.) Lagerh.

In a pond, Umred (30-11-64).

##### **G. gigas** (Kuetz.) Lagerh.

In Vadali lake, Amravati (18-10-64).

##### **Tetraspora gelatinosa** (Vauch.)

Desvaux

In a lake (8), Yeotmal (14-11-68).

##### **T. lacustris** Lemm.

In Abkari lake (7.5), Bhandara (28-11-68).

##### **Elakatothrix viridis** (Snow) Printz

In paddy fields, Amravati (13-10-64). In newly constricted cement cisterns, Khamgaon (13-10-67), Akola (13-10-68), Bhandara (12-1-69).

##### **Micractinium pusillum** Fresen

In Khamb lake (9), Bhandara (28-12-68).

**Dictyosphaerium pulchellum** Wood

In Nursery pond (8), Bhandara (21-12-68).

**Dimorphococcus lunatus** A. Br.

In a pond, Umred (30-11-64). In Abkari lake (7.5), Bhandara (28-12-68). In Mendhe lake (9.5), Bhandara (19-1-69).

**Schroederia indica** Philipose

Planktonic in a bodhan, Amravati (18-10-64).

**S. robusta** Korsh.

Planktonic in a pool, Wardha (14-10-65).

**S. setigera** (Schroeder) Lemm.

Planktonic in a bodhan<sup>1</sup>, Amravati (18-10-64). Pyrenoids present.

**Korshikoviella gracilipes** (Lamb.)

Silva

Planktonic in a pool, Amravati (18-10-64).

**Pediastrum boryanum** (Turpin)

Meneghini

In a lake (8.2), Dahegaon (27-12-64). In Vadali lake, Amravati (3-3-65). In Ramsagar lake (7.2), Tiroda (2-2-69).

**P. duplex** Meyen

In a pond, Mansar (13-12-64). In a lake (8), Yeotmal (24-11-68). In Nave lake (9.5), Bhandara (19-1-69).

**P. duplex** Meyen v. **clathratum** (A. Br.) Lagerh.

In Abkari lake (7.5), Bhandara (28-12-68).

**P. duplex** Meyen v. **cohaerens**

Bohlin

In a pond, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**P. duplex** Meyen v. **gracilimum** West et West

In a pond (8.5), Bhandara Road (19-1-69).

**P. integrum** Naeg. v. **perforatum** Racib.

In Ramsagar lake (7.2), Tiroda (2-2-69). Cells broader up to 35  $\mu$ .

**P. muticum** Kuetz.

In ponds, Mansar (13-12-64).

<sup>1</sup> Bodhan = Buffalo wallow.

**P. simplex** Meyen

In Vadali lake, Amravati (18-10-64). In droppings of birds near Vena dam (1-2-69). In a pond, Bhandara (3-3-69).

**P. simplex** Meyen v. **duodenarium**

(Baily) Rabenh.

In Vadali lake, Amravati (3-3-65). In a pond (8.5), Bhandara Road (19-1-69).

**P. tetras** (Ehrenb.) Ralfs

In ponds, Umred (30-11-64), Mansar (13-12-64). In Vadali lake, Amravati (3-3-65). In Sarkari lake (7.2), Tumsar (22-12-68). In Mendhe lake (9.5), Bhandara (19-1-69).

**P. tetras** (Ehrenb.) Ralfs. v. **tetraedron** (Corda) Hansg.

In Pavnar dam (27-10-64).

**Sorastrum americanum** (Bohlin)

Schmidle

In a pond, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (29-12-68).

**S. americanum** (Bohlin) Schmidle v. **undulatum** G. M. Smith

In Vadali lake, Amravati (3-3-65).

**S. spinulosum** Naeg.

In paddy fields, Amravati (18-10-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (19-12-68).

**Coelastrum cambricum** Arch. v. **intermedium** (Bohlin) G. S. West

In Vadali lake, Amravati (18-10-64; 3-3-65). In ponds, Umred (30-11-64). In Sarkari lake (7.2), Tumsar (22-12-64). In Abkari lake (7.5), Bhandara (29-12-68). In Mendhe lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. microporum** Naeg.

In Sarkari lake (7.2), Tumsar (29-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. reticulatum** (Dang.) Senn

In Abkari lake (7.5) Bhandara (29-12-68).

**Westella botryoides** (W. West) De Wild.

In a nursery pond (8), Bhandara (28-12-68).

**Nephrocitium hydrophilum** (Turn.) Wille

In Vadali lake, Amravati (3-3-65).

**N. obesum** West et West

In paddy fields, Amravati (13-12-64).

**Trochiscia reticularis** (Reinsch)

Hansg.

In ponds, Mansar (13-12-64).

**Oocystis borgei** Snow

In Pavnar dam (27-10-64). In Zarpāt stream, Chanda (1-11-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Nursery pond (8), Bhandara (28-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. elliptica** W. West

In ponds, Umred (30-11-64). In Vadali lake, Amravati (3-3-65).

**O. gigas** Arch.

In Vadali lake, Amravati (18-10-64).

**O. macrospora** (Turn.) Brunth.

Rare. In a pond, Mansar (13-12-64).

**O. pusilla** Hansg.

In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (29-12-68).

**O. solitaria** Wittr. v. **major** Wille

In a pond, Mansar (13-12-64).

**Gloeotaenium loitsbergianum** Hansg.

In Vadali lake, Amravati (18-10-64; 3-3-65). In Abkari lake (7.5), Bhandara (19-1-69).

**Ankistrodesmus convolutus** Corda

In Mendhe lake (9.5), Bhandara (19-1-69).

**A. falcatus** (Corda) Ralfs

In ponds, Umred (30-11-64), Mansar (13-12-64). In Vadali lake, Amravati (3-3-65). In Sarkari lake (7.2), Tumsar (22-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**A. falcatus** (Corda) Ralfs v. **acicularis** (A. Br.) G. S. West

In a cement cistern, Amravati (18-10-64). In Nursery pond (8), Bhandara (28-12-68).

**A. falcatus** (Corda) Ralfs v. **miraibilis** (West et West) G. S. West

In Vadali lake, Amravati (3-3-65).

**A. falcatus** (Corda) Ralfs v. **tumidus** (West et West) G. S. West

In paddy fields and in cement cisterns, Amravati (18-10-64).

**A. spiralis** (Turn.) Lemm.

In ponds, Umred (30-11-64). In Abkari lake (7.5), Bhandara (26-12-68).

**Selenastrum bibraianum** Reinsch

In a pond, Umred (30-11-64).

**Kirchneriella lunaris** (Kirchn.) Moebius

In Mendhe lake (9.5), Bhandara (19-1-69).

**K. lunaris** (Kirchn.) Moebius v. **irregularis** G. M. Smith

In ponds, Umred (30-11-64).

**K. subsolitaria** G. S. West

In Mendhe lake (9.5), Bhandara (19-1-69).

Cells sometimes bigger in size, up to 6.5  $\mu$  broad and 20  $\mu$  long.

**Tetraedron hastatum** (Reinsch)

Hansg.

Very rare. In a bodhan, Amravati (13-10-64).

**T. minimum** (A. Br.) Hansg.

In Vadali lake, Amravati (3-3-65).

**T. pentaedricum** West et West

In Khamb lake (9), Bhandara (28-12-68).

**T. pusillum** (Wall.) West et West

In Nursery pond (8), Bhandara (12-1-69).

**T. trigonum** (Naeg.) Hansg.

In Vadali lake, Amravati (3-3-65). In Nursery pond (8), Bhandara (28-12-68).

**Scenedesmus arcuatus** Lemm. v. **platydisca** G. M. Smith

In a pool, Satnavari (18-10-64). In ponds, Umred (30-11-64). In Mendhe pond (9.5), Bhandara (19-1-69).

**S. bijuga** (Turp.) Lagerh.

In a pond (8.5), Bhandara Road (19-1-69).

**S. bijuga** (Turp.) Lagerh. v. **alternans** (Reinsch) Hansg.

In ponds, Umred (30-11-64), Mansar (13-12-64). In Zarpāt stream, Chanda (1-11-65). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (28-12-68).

**S. bijuga** (Turp.) Lagerh. v. **alternans** (Reinsch) Hansg. f. **parvus** G. M. Smith

In pools, Wardha (14-10-64). In Zarpot stream, Chanda (1-11-65).

**S. denticulatus** Lagerh.

In Abkari lake (7.2), Bhandara (29-12-68).

**S. denticulatus** Lagerh. v. **australis** Playf.

In Abkari lake (7.2), Bhandara (29-12-68).

**S. dimorphus** (Turp.) Kuetz.

In Zarpot stream, Chanda (1-11-64). In Vadali lake, Amravati (3-3-65). In Sarkari lake (7.2), Tumsar (22-12-68). In a pond (8.5), Bhandara Road (19-1-69).

**S. hystrix** Lagerh.

In Abkari lake (7.2), Bhandara (28-12-68).

**S. longus** Meyen

In ponds, Umred (30-11-64).

**S. longus** Meyen v. **minutum** G. M. Smith

In Abkari lake (7.2), Bhandara (29-12-68).

**S. obliquus** (Turp.) Kuetz.

In Sarkari lake (7.2), Tumsar (22-12-68). In Nursery pond (8), Bhandara (22-12-68).

**S. quadricauda** (Turp.) De Breb. v. **longispina** (Chodat) G. M. Smith

In a pool, Satnavri (18-10-64). In Zarpot stream, Chanda (1-11-64).

**S. quadricauda** (Turp.) De Breb. v. **maximus** West et West

In a gutter, Wardha (27-10-64). In Sarkari lake (7.2), Tumsar (22-12-68). In a pond (8.5), Bhandara Road (19-1-69).

**Crucigenia rectangularis** (Naeg.) Gay  
Rare. In Vadali lake, Amravati (18-10-64).

**Tetrallantos lagerheimii** Teiling

In a pond, Umred (30-11-64).

**Ulothrix aequalis** Kuetz.

In a pond, Umred (30-11-64).

**U. cylindricum** Prescott

In a pool, Wardha (27-10-64).

**U. subconstricta** G. S. West

In a pond, Umred (30-11-64).

**U. tenerrima** (Kuetz.) Kuetz.

In a drying bodhan, Satnavri (18-10-64). In a pond, Umred (20-11-64). In Vadali lake, Amravati (3-3-65). In a pond (8.2), Tumsar (22-11-68).  
**Cylindrocapsa oedogoniodes** Randhawa

In a pond, Mansar (13-12-67).

**Stigeoclonium attenuatum** (Hazen) Collins

In a pond, Umred (30-11-64).

**S. hubneri** Heering

In Sarkari lake (7.2), Tumsar (22-12-68).

The alga is characterized by long, multicellular hairs.

**S. lubricum** (Dillw.) Kuetz.

Adhering to the stones in a streamlet, Amravati (18-10-64).

**S. nanum** Kuetz.

In ponds, Umred (30-11-64), Mansar (13-12-64).

**Chaetophora pisciformis** (Roth)

Agardh

Common. In puddles, pools, Mansar (20-9-64).

**Coleochaete irregularis** Pringsheim

Epiphytic on *Chara* sp. in Sarkari lake (7.2), Tumsar (22-11-68).

**C. orbicularis** Pringsheim

Epiphytic on aquatic plants in ponds, Mansar (13-12-64). In Vadali lake (9), Amravati (18-10-69). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. scutata** De Breb.

Epiphytic on *Ipomoea* sp. in Sarkari lake (7.2), Tumsar (22-12-68). Epiphytic on grass in Ramsagar (7.2), Tiroda (2-2-69).

**C. soluta** (De Breb.) Pringsheim

Epiphytic on grass in Ramsagar lake (7.2), Tiroda (2-2-69).

**Protococcus viridis** C. A. Agardh

On moist earthen pots, Amravati (18-10-64).

**Fritschiella tuberosus** Iyengar

On moist soil near Gaon lake, Sakoli (5-10-69).

**Chaetosphaeridium globosum**

(Nordst.) Klebahn

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. pringsheimii** Klebahn f. *conferta* Klebahn

In Abkari lake (7.5), Tumsar (29-11-68).

**Gomontia holdenii** Collins

In mucilaginous masses of other algae, in a pond, Umred (30-11-64).

**Rhizoclonium hieroglyphicum** (C. A. Ag.) Kuetz.

Common. In a streamlet, Amravati (18-10-64). In Pavnar dam (27-10-64). On dripping rocks, Amravati (3-3-65). In cement cisterns, Khamgaon (13-10-67), Bhandara (12-1-69), Amravati (2-3-69), Wardha (4-4-69). On dripping stone and brick walls near Gaumukh, Lonar (24-10-68), Khamb lake (9), Tiroda (2-2-69). On shaded moist soil, Akola (6-3-69).

The alga shows variation in size. Usually there is no branching and when it is present, the branches are very short and one to two-celled.

**Pithophora oedogonia** (Mont.) Wittr.

Common. In small pools, puddles, cement cisterns and at the shore of ponds, Amravati, Dahegaon, Katol, Khamgaon, Gondia, Sakoli, Wardha, Tiroda (August-March).

**Cladophora glomerata** (L.) Kuetz.

Attached to the sides of cement cisterns, Amravati (18-10-64). Epizoid on snails in ponds, lakes, Amravati, Gondia, Lonar, Sakoli and Yeotmal (October-March).

**Oedogonium aster** Wittr. ex Hirn

In Vadali lake, Amravati (3-3-65).

**O. australianum** Hirn

In a pond, Mansar (13-12-64).

**O. autumnale** Wittr. ex Hirn

In ponds, Umred (30-11-64).

**O. calvum** Wittr. ex Hirn

In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. cardiacum** (Hass.) Wittr. ex Hirn f. *interjectum* Hirn

In Abkari lake (7.5), Bhandara (29-11-68).

**O. crispum** (Hass.) Wittr. ex Hirn

In a pond, Umred (30-11-64).

**O. elegans** West et West v. *americanum* Jao

In a pond, Ramtek (13-12-64). In

Ramsagar lake (7.2), Tiroda (2-2-69).

The alga from Ramsagar lake has longer vegetative cells—up to 80  $\mu$  long.

**O. ellipsoideum** Jao

In a pond, Mansar (13-12-64). Oogonia slightly longer—up to 81  $\mu$  long.

**O. flexuosum** Hirn

In a lake (8), Yeotmal (24-11-68).

Hirn (1900), Tiffany (1930) and Gemeinhardt (1939) describe the alga as incompletely known. In Yeotmal material male filaments are also present. Vegetative cells 19-22  $\mu$  broad, 21-23 (-24.5)  $\mu$  long; antheridia in series of 4-12, 16.2-17.4  $\mu$  broad, 6.5-12.2  $\mu$  long.

The alga is heavily calcium incrustated.

**O. inconspicuum** Hirn

In a pond, Mansar (13-12-64).

**O. inframediale** Jao

In a pond, Mansar (13-12-64).

**O. obesum** (Wittr.) Hirn

In Nave lake (9.5), Bhandara (12-1-69).

**O. obtruncatum** Wittr. ex Hirn v. *ellipsoideum* Wittr. ex Hirn

In Abkari lake (7.5), Bhandara (29-11-68).

**O. plagiostomum** Wittr. ex Hirn v. *gracilis* Wittr. ex Hirn

In Khamb lake (9), Bhandara (28-12-68).

**O. poecilosporum** Nord. et Hirn

In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. porrectum** Nordst. ex Hirn

In a pond, Mansar (13-12-64).

**O. pringsheimii** Cramer: Wittr. ex Hirn v. *nordstedtii* Wittr. ex Hirn

In Nave lake (9.5), Bhandara (19-1-69).

Male filaments not observed. Female filament cells slightly capitate.

**O. pseudospirale** Nygaard

In Nave lake (9.5), Bhandara (19-1-69).

**O. pusillum** Kirchn. ex Hirn

In paddy fields, Vadali lake, Amravati (18-10-64). In Sarkari lake

(7.2), Tumsar (22-12-68).

**O. santurcense** Tiff.

In a pond, Umred (30-11-64). In Abkari lake (7.2), Bhandara (28-11-68).

**O. subaerolatum** Jao

In paddy fields, Amravati (18-10-64).

**O. tapeinosporum** Wittr. ex Hirn

In Vadali lake, Amravati (3-3-65). In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. undulatum** (Breb.) Al. Braun; Wittr. ex Hirn

In Vadali lake, Amravati (18-10-64, 3-3-65). In a pond, Umred (30-11-64). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69). In a pond, Wardha (15-10-69).

**O. urbicum** Wittr. ex Hirn

In Nave lake (9.5), Bhandara (19-1-69).

**O. virceburgense** Hirn

In paddy fields, Vadali lake, Amravati (18-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**Bulbochaete diamesandria** Nordstedt ex Hirn

In ponds, Umred (30-11-64), Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**B. lagoensis** Wittr. ex Hirn

In Ramsagar lake (7.2), Tiroda (2-2-69).

**B. varians** Wittr. ex Hirn

Very rare. In Vadali lake, Amravati (3-3-65).

**Netrium digitus** (Ehrenb.) Itzig. et Roth v. **lamellosum** (Breb.) Gronbl.

In Ramsagar lake (7.2), Tiroda (2-2-69).

**Cylindrocystis americana** West et West v. **minor** Cushm.

In a pond (7.8), Mansar (9-10-69).

**Gonatozygon aculeatum** Hast.

In a pond (8), Mansar (9-10-69).

**G. kinahani** (Arch.) Rabenh.

In a pond, Mansar (13-12-64).

**G. monotaenium** De Bary

In ponds, Umred (30-11-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Gaon pond (8), Sakoli (7-1-

69). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**G. pilosum** Wille

In a pond, Mansar (13-12-64).

**Pleurotaenium baculoides** (Roy et Biss.) Playf.

In a streamlet, Satnavri (18-10-64). In a pond, Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

Zygospores are present in Tiroda material. They are ellipsoid, 56-62  $\mu$  broad, 80-84  $\mu$  long, with spiny outer wall.

**P. ehrenbergii** (Breb.) De Bary

In Sarkari lake (7.2), Tumsar (22-12-68).

**P. elatum** (Turner) Borge v. **subundulatum** Hirano

In a rock pool, Satnavri (18-10-64).

**P. indicum** (Grun.) Lund

In Abkari lake (7.5), Bhandara (29-11-68). In Sarkari lake (7.2), Tumsar (22-12-68).

**P. inermium** (Moeb.) Hirano

In a pond, Umred (30-11-64). In Ramala lake, Chandrapur (1-11-65). In Nave lake (9.5), Bhandara (19-1-69).

**P. ovatum** Nordst.

In a streamlet, Satnavri (18-10-64). In a pond, Mansar (13-12-64). In Ramala lake, Chandrapur (1-11-65). In Nave lake (9.5), Bhandara (19-1-69).

**P. simplicissimum** Gronbl.

In Sarkari lake (7.2), Tumsar (22-12-68).

**P. simplicissimum** Gronbl. v. **semiundulatum** Hirano

In a pond, Umred (20-10-64). In Ramala lake, Chandrapur (1-11-65). In Sarkari lake (7.2), Tumsar (22-12-68).

**P. subcoronulatum** (Turn.) West et West

In a pond, Mansar (13-12-64).

**P. trabecula** (Ehrenb.) Naeg.

In Vadali lake, Amravati (18-10-64). In Motha lake, Umred (30-11-

64). In Sarkari lake (7.2), Tumsar (22-12-68).

Curved semicells are commonly found in Tumsar material.

**P. trabecula** (Ehrenb.) Naeg. f. **clavata** (Kuetz.) West et West

In a pond, Mansar (13-12-64).

Occasionally cells longer—up to 615  $\mu$  long.

**P. trabecula** (Ehrenb.) Naeg. v. **maximum** (Reinsch) Roll f. **constrictum** Scott et Prescott

In Nave lake (9.5), Bhandara (19-1-69).

**P. trabecula** (Ehrenb.) Naeg. v. **rectum** (Delp.) West et West

In a pond, Umred (30-11-64). In Vadali lake, Amravati (3-3-65). In Ramsagar lake (7.2), and Belati pond (7.5), Tiroda (2-2-69).

**Closterium acerosum** (Schrank) Ehrenberg

In a pond, Umred (30-11-64).

**C. acerosum** (Schrank) Ehrenb. f. **rectum** Scott et Prescott

In Zarpot stream, Chandrapur (1-11-65).

**C. aciculare** West et West

In Vadali lake, Amravati (3-3-65).

**C. acutum** Breb.

In ponds, Umred (30-11-64), Mansar (13-12-64), and in Nursery pond (8), Bhandara (28-12-68).

**C. acutum** Breb. v. **variable** (Lemm.) Krieger

In a rock pool, Satnavri (18-12-64). In Nave lake (8), Sakoli (5-1-69).

**C. calosporum** Wittr.

In a puddle, Wardha (3-4-65).

**C. calosporum** Wittr. v. **brasiliense** Borg.

In a pond, Umred (30-11-64).

**C. cornu** Ehrenb.

In a streamlet, Satnavri (18-10-64). In a lake (8), Yeotmal (24-11-68). In Sarkari lake (7.2), Tumsar (22-12-68).

The Yeotmal alga agrees with form *alfa* of Croasdale (1955).

**C. cornu** Ehrenb. v. **upsaliense** Nordst.

In a pond, Umred (30-11-64).

**C. cynthia** De Not

In a pond, Umred (13-11-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

Striations 6-8 in 10  $\mu$ .

**C. diana** Ehrenb.

In a pond, Umred (30-11-64). In a lake (8.2), Dahegaon (27-12-64). In Vadali lake, Amravati (3-3-65). In Abkari lake (7.2), Bhandara (29-12-68). In a pond (8.2), Jawahar Nagar (12-1-69). In Mendhe lake (9.5), Bhandara (19-1-69).

**C. ehrenbergii** Menegh.

In a pond, Umred (30-11-64).

**C. gracile** Breb.

In bodhans, Amravati (18-10-64). In Zarpot stream, Chandrapur (1-11-65).

**C. idiosporum** West et West

In a lake (8), Yeotmal (24-11-68).

**C. incurvum** Breb.

In a streamlet, Satnavri (18-10-64). In Vadali lake, Amravati (18-10-64, 3-3-65). In a lake (7.2), Sakoli (14-1-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. jenniferi** Ralfs

In a streamlet, Satnavri (18-10-64). In a pond (8.2), Dahegaon (27-12-67). In Mendhe lake (9.5), Bhandara (19-1-69).

**C. jenniferi** Ralfs v. **tenue** Croasdale

In a pond, Umred (30-11-64). In Mendhe lake (9.5), Bhandara (19-1-69).

**C. kuetzingii** Breb.

In a pond, Umred (30-11-64).

**C. lanceolatum** Kuetz.

In a pool, Satnavri (18-10-64). In bodhans, Amravati (18-10-64). In ponds, Umred (30-11-64).

**C. leibleinii** Kuetz.

In puddles, Mansar (13-12-64).

**C. libellula** Focke

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. lineatum** Ehrenb.

In a pond, Mansar (13-12-64).

**C. littorale** Gay

In ponds, Umred (30-11-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara



(28-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. macilentum** Breb.

In Sarkari lake (7.2), Tumsar (22-12-68). In Gaon lake (7.2), Sakoli (5-1-69).

**C. parvulum** Naeg.

In a streamlet, Satnavri (18-10-64). In a pond, Umred (30-11-64). In Ramala lake, Chandrapur (1-11-65). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. setaceum** Ehrenb.

In a pond, Umred (30-11-64).

**C. sinense** Lutkem.

In a streamlet, Satnavri (18-10-64). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. tumidulum** Gay

In Vadali lake, Amravati (3-3-65, 18-10-69). In a lake (8), Yeotmal (24-11-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (29-12-68).

**C. tumidum** Johnson

In a pond, Mansar (13-12-64).

**C. venus** Kuetz.

In a pond, Mansar (13-12-64). In a pond (8), Jawahar Nagar (12-1-69).

**C. venus** Kuetz. v. **incurvum** (Breb.) Krieger

In Vadali lake, Amravati (3-3-65). **Cosmarium abbreviatum** Racib.

In Nave lake (9.5), Bhandara (19-1-69).

**C. abbreviatum** Racib. f. **pygmaea** Messik.

In Vadali lake, Amravati (18-10-64, 3-3-65).

**C. amoenum** Breb.

In a pond, Umred (30-11-64). In Abkari lake (7.5), Bhandara (29-11-68).

**C. angulosum** Breb. v. **concinuum** (Rabenh.) West et West

In a pond (8), Jawahar Nagar (12-1-69).

**C. auriculatum** Reinsch

In a pool, Satnavri (18-10-64). In Vadali lake, Amravati (18-10-64). In Zarpal stream, Chandrapur (1-11-65). In ponds, Mansar (10-12-65). In Sar-

kari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (29-12-68).

Cells slightly shorter up to 48  $\mu$  long and cell wall finely punctate.

**C. bengalense** (Grun.) Turn.

In a pond, Umred (30-11-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (28-12-68).

Bhandara alga is slightly bigger—up to 49  $\mu$  broad, 82  $\mu$  long.

**C. biloculatum** Breb. v. **subpunctulatum** Krieger et Gerloff

In a pond, Umred (30-11-64). In Nave lake (9.5), Bhandara (19-1-69).

**C. binum** Nordst.

In a pond, Umred (30-11-64).

**C. botrytis** Menegh.

Rare. In Vadali lake, Amravati (3-3-65).

**C. ceylanicum** West et West f. **minus** Scott et Prescott

In a pond, Mansar (13-12-64).

**C. connatum** Breb.

In paddy fields, Amravati (18-10-64).

**C. contractum** Kirchn.

In a pond, Umred (30-11-64).

**C. contractum** Kirchn. f. **jacobsenii** (Roy) West et West

In paddy fields, Amravati (18-10-64). In ponds, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. contractum** Kirchn. v. **ellipsoideum** (Elf.) West et West

In Vadali lake, Amravati (18-10-64). In a pond, Mansar (13-12-64).

**C. contractum** Kirchn. v. **minutum** (Delp.) West et West

In a pond, Mansar (13-12-64).

**C. contractum** Kirchn. v. **norvegicum** Racib.

In a pond (8), Jawahar Nagar (12-1-69).

**C. cucurbitinum** (Biss.) Lutkem.

In a pond, Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. cucurbitinum** (Biss.) Lutkem. v. **grande** Gronbl.

In paddy fields, Amravati (18-10-64).

**C. depressum** (Naeg.) Lund v. **intermedium** (Gutw.) Messik.

In the scum on submerged stones in Kapsi lake (8.2), Akola (18-10-68).

The cells much smaller, 21-25  $\mu$  broad, 22-27  $\mu$  long, isthmus 6-7  $\mu$  broad.

**C. difficile** Lutkem. v. **dialatum** Borge

In ponds, Mansar (13-12-64).

**C. dispersum** Johnson

In Abkari lake (7.5), Bhandara (29-12-68).

Cells slightly broader.

**C. dispersum** Johnson v. **truncatum** (West et West) Krieger et Gerloff

In Abkari lake (7.5), Bhandara (22-11-68).

**C. dubicum** Borge

In Vadali lake, Amravati (18-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. dybowskii** Gutw.

In Mendhe lake (9.5), Bhandara (19-1-69).

**C. elegantissimum** Lund f. **minor** West

In ponds, Mansar (13-12-64).

**C. exiguum** Arch.

In a pond, Umred (30-11-64).

**C. freemanii** West et West

In a pond, Umred (30-11-64).

**C. furcatospermum** West et West v. **koreana** Skv.

In cement cisterns, Amravati (18-10-64).

**C. fuscescens** Hirano

In a pond, Mansar (13-12-64). In scum on the submerged stones in Kapsi lake (8.2), Akola (16-10-68).

Present alga is bigger than the type — 13-15  $\mu$  broad, 10-20  $\mu$  long.

**C. garrolense** Roy et Biss. v. **crassum** Jao

In paddy fields, Amravati (18-10-64).

**C. granatum** Breb.

In Vadali lake, Amravati (18-10-64).

**C. hammeri** Reinsch v. **homaloderum** (Nordst.) West et West

In Mendhe lake (9.5), Bhandara (19-1-69).

**C. hammeri** Reinsch v. **protuberans** West et West

In Vadali lake, Amravati (18-10-64).

**C. impressulum** Eلفv.

In Vadali lake, Amravati (18-10-64). In Zarpat stream, Chandrapur (1-11-65). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. impressulum** Eلفv. v. **octangularis** Hirano

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. inconspicuum** Arch.

In Vadali lake, Amravati (18-10-64).

**C. infirmum** Gronbl. v. **minus** (Gronbl.) Krieger et Gerloff

In a pond (8), Jawahar Nagar (12-1-69).

**C. laeve** Rabenh.

In Vadali lake, Amravati (18-10-64). Adhering to the rocks near Gandhi ghat, Pavnar (27-10-64). In a pond, Umred (30-11-64).

**C. laeve** Rabenh. v. **depressum** Croasdale

In Vadali lake and nearby paddy fields, Amravati (18-10-64). In Sarkari lake (7.2), Tumsar (22-12-68).

The alga is sometimes slightly bigger, 10.5-10.8  $\mu$  broad, 14.5-15  $\mu$  long. It agrees well with the figures given by Croasdale (1956) but not with the figures given by Krieger and Gerloff (1969), pl. 44, f. 7a) though the figures are reproduced from Croasdale, the sinus being shown differently.

**C. lagenarioides** (Roy) Lutk.

In Mendhe lake (9.5), Bhandara (19-1-69).

**C. lunatum** Wolle v. **sparsum** (Turn.) Krieger et Gerloff

In a pond, Mansar (13-12-64).

The present alga is bigger in size, 40-42  $\mu$  broad, 28-29  $\mu$  long, isthmus 10-10.5  $\mu$  broad.

**C. lundellii** Delp. v. **circulare** (Reinsch) Krieger

In Vadali lake, Amravati (3-3-65). In the scum on the submerged stones

in Kapsi lake (8.2), Akola (16-10-68).

**C. lundellii** Delp. v. **corruptum**  
(Turn.) West et West

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. lundellii** Delp. v. **ellipticum** West  
In a pond, Mansar (13-12-64). In Nave lake (9.5), Bhandara (19-1-69). In Nave lake (8), Sakoli (12-1-69). In a pond (8), Jawahar Nagar (12-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. maculatum** Turn.

In a pond, Umred (21-11-64). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. mansangense** West et West

In Sarkari lake (7.2), Tumsar (22-12-68).

**C. margaritatum** (Lund) Roy et Bisset

In the scum on the submerged stones in Kapsi lake (8.2), Akola (16-10-68). In a pond (8), Jawahar Nagar (12-1-69).

**C. margaritatum** (Lund) Roy et Bisset f. **minor** (Boldt) West et West

In a pond, Umred (30-11-64). In a pond (8), Jawahar Nagar (12-1-69). In Mendhe lake (9.5), Bhandara (19-1-69).

**C. moniliforme** (Turp.) Ralfs v. **pan-**  
**duriforme** (Heimerl) Schmidle

In Abkari lake (7.5), Bhandara (29-12-68).

**C. nymannianum** Grun.

In a pond (8.2), Dahegaon (27-12-64).

**C. nymannianum** Grun. v. **brevis**  
(Wille) Krieger et Gerloff

In a pond, Umred (30-11-64).

**C. obsoletum** (Hantzsch) Reinsch v. **sitvense** Gutw.

In a pond, Umred (30-11-64).

**C. obtusatum** Schmidle

In a dam, Pavnar (27-10-64). In a pond, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Mendhe lake (9.5), Bhandara (19-1-69).

**C. orthostichum** Lund

In a lake (8), Yeotmal (24-11-68).

**C. orthostichum** Lund f. **subpolonica**  
Messik.

In a lake (8), Yeotmal (24-11-68).

**C. phaseolus** Breb. v. **achondrum**  
Boldt

In Sarkari lake (7.2), Tumsar (22-12-68).

**C. polonicum** Racib.

In Sarkari lake (7.2), Tumsar (22-12-68).

**C. polygonum** (Naeg.) Arch.

In a pond, Mansar (13-12-64).

**C. portianum** Arch.

In the scum on the submerged stones in Kapsi lake (8.2), Akola (16-10-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. portianum** Arch. v. **nephroideum**  
Wittr.

In Vadali lake, Amravati (18-10-64, 20-10-69).

**C. pseudadoxum** Jao

In Chattri lake, Amravati (18-10-64).

**C. pseudoconnatum** Nordst.

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. pseudohexagonoides** Bruhl et Biswas

On the stone wall of Vadali, Amravati (18-10-64).

**C. pseudopyramidatum** Lund

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. pseudopyramidatum** Lund v. **bor-**  
**gei** Krieger et Gerloff

In Abkari lake (7.5), Bhandara (29-2-68). In Sarkari lake (7.2), Tumsar (22-12-68).

**C. pseudopyramidatum** Lund v. **car-**  
**niolicum** Lutk.

In a lake (7.5), Tumsar (22-12-68). In a pond (8), Jawahar Nagar (12-1-69).

**C. pseudopyramidatum** Lund v. **lenti-**  
**ferum** Taylor

On submerged soil in Vena dam (1-2-69).

**C. pseudopyramidatum** Lund v. **rot-**  
**undatum** Krieger et Gerloff

In Painganga river (8.5), Mehkar (20-10-68).

- C. pyramidatum** Breb.  
In paddy fields, Amravati (18-10-64). In a lake (8.2), Dahegaon (27-12-64). In Vadali lake (9), Amravati (18-10-69).
- C. pyramidatum** Breb. v. **convexum** Krieger et Gerloff  
In Vadali lake (9), Amravati (18-10-69).
- C. quadratulum** (Gay) De Toni  
In a dam, Pavnar (27-10-64).
- C. quadratum** Ralfs  
In Ramsagar lake (7.2), Tiroda (2-2-69).  
Krieger and Gerloff (1969) include *C. quadratum* f. *major* Irene Marie in *C. quadratum*. The present alga agrees with f. *major* in size.
- C. quadratum** Ralfs f. **willei** West et West  
In Vadali lake, Amravati (3-3-65).
- C. quadrum** Lund  
In Mendhe lake (9.5), Bhandara (19-1-69).
- C. quinarium** Lund  
In Nave lake (9.2), Bhandara (19-1-69).
- C. ralfsii** Breb. v. **alpinum** Racib.  
In Vadali lake, Amravati (18-10-64).
- C. ralfsii** Breb. v. **montanum** Racib.  
In a pond, Umred (30-11-64).
- C. rectangulare** Grun. v. **africanum** West et West  
In a pond, Umred (30-11-64).
- C. regnellii** Wille  
In a lake (8.2), Dahegaon (27-12-64).
- C. regnellii** Wille v. **kerquelse** Krieger et Gerloff  
In paddy fields, Amravati (18-10-64).
- C. reniforme** (Ralfs) Arch.  
In a pond (8), Jawahar Nagar (12-1-69).
- C. repandum** Nordst. f. **minor** West et West  
In Nave lake (8), Sakoli (5-1-69).
- C. retusiformae** (Wille) Gutw.  
In a pond, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68).
- C. sexangulare** Lund  
In Vadali lake (9), Amravati (18-11-68).
- C. sexangulare** Lund f. **minimum** Nordst.  
In Vadali lake (9), Amravati (18-11-68). In Abkari lake (7.5), Bhandara (25-11-68). In Ramsagar lake (7.2), Tiroda (2-2-69).
- C. sikhimense** Turn.  
In the mucilaginous mass of *Gloeotrichia* sp. floating in Vadali lake, Amravati (18-10-64).
- C. speciosum** Lund v. **incrassatum** Insam et Krieger  
In a pond (8), Jawahar Nagar (12-1-69).  
The present alga differs from the type in having rounded apex as shown by Croasdale (1956).
- C. striolatum** Naeg. v. **nordstedtii** (Moeb.) Krieger  
In ponds, Umred (30-11-64).
- C. subacutangulum** Gronbl.  
In a pond (8), Jawahar Nagar (12-1-69).
- C. sublatere-undateim** West et West  
In a pond, Umred (30-11-64).
- C. subreinschii** Schmid v. **ocellatum** West et West  
In Vadali lake, Amravati (3-3-65).
- C. subtransiens** Croasdale  
In Ramsagar lake (7.2), Tiroda (2-2-69).  
The alga differs from the type in having 12 undulations instead of 10.
- C. subtumidum** Nordst.  
In Vadali lake (9), Amravati (18-11-68). In Sarkari lake (7.2), Tumsar (22-12-68).
- C. subtumidum** Nordst. f. **minor** Krieger  
In Vadali lake, Amravati (18-10-64).
- C. subtumidum** Nordst. v. **rotundum** Hirano  
In a pond (8), Jawahar Nagar (12-1-69).
- C. supraconnatum** (Turn.) Krieger et Gerloff  
In Abkari lake (7.5), Bhandara (29-11-68).

**C. striolatum** Naeg.

In Nave lake (9.5), Bhandara (19-1-69).

**C. trachydermum** West et West

In a streamlet, Satnavri (18-10-64).

**C. trachypleurum** Lund v. **nordstedtii** Gutw.

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. trafalgaricum** Wittr.

In a cement water passage in a garden, Wardha (12-3-68).

**C. trilobatum** Reinsch v. **printzii** Messik.

In a pond, Umred (30-11-64).

Umred alga agrees with Skuja's Westonian island form (Hirano 1957).

**C. triplicatum** Wolle

In Sarkari lake (7.2), Tumsar (22-12-68).

**C. tryolicum** (Nordst.) Krieger et Gerloff

In Vadali lake (9), Amravati (18-11-68).

**C. tuddalense** Strom

In Nave lake (8), Sakoli (5-1-69).

**C. tumidum** Lund

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. undulatum** Corda ex Ralfs

In a pond, Umred (30-11-64).

**C. undulatum** Corda ex Ralfs v. **crenulatum** (Naeg.) Wittr.

In a pool, Wardha (27-10-64).

**C. undulatum** Corda ex Ralfs v. **minutum** Wittr.

In Vadali lake, Amravati (18-10-64). In a dam, Pavnar (27-10-64). In Abkari lake (7.5), Bhandara (29-12-68). In a pond (8), Jawahar Nagar (12-1-69).

**C. undulatum** Corda ex Ralfs v. **wollei** W. West

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. variolatum** Lund v. **rotundatum** (Krieger) Messik.

In a pond (8.5), Bhandara Road (19-1-69).

**C. venustum** (Breb.) Arch. v. **brevis** Bernard

In a pool, Satnavri (18-10-64).

**C. virde** (Corda) Josh. f. **minor** W. West

In small ponds, Wardha (27-10-64).

**C. virde** (Corda) Josh. v. **hibernicum** (W. West) Krieger et Gerloff

In Nave lake (9.5), Bhandara (19-1-69).

**C. wittrockii** Lund

In Vadali lake, Amravati (18-10-64).

**Euastrum bidentatum** Naeg.

In a pond, Umred (30-11-64).

**E. binale** (Turp.) Ehrenb. v. **koreana** (Skv.) Okada

In a pond, Umred (30-11-64).

**E. binale** (Turp.) Ehrenb. v. **sectum** Turn.

In a lake (8.2), Dahegaon (27-12-64).

**E. ceylanicum** (West et West) Krieger

In Sarkari lake (7.2), Tumsar (22-12-68). In Nave lake (9.5), Bhandara (19-1-69).

**E. denticulatum** (Kirchn.) Gay

In a lake, Mansar (13-12-64).

**E. divergens** Josh. v. **ornatum** (Borge) Schm.

In Abkari lake (7.5), Bhandara (28-12-68).

**E. elegans** (Breb.) Kuetz. v. **pseudelegans** (Turn.) West et West

In ponds, Umred (30-11-64), Mansar (13-12-64). In Vadali lake, Amravati (3-3-65).

**E. inerme** (Ralfs) Lund

In Ramsagar lake (7.2), Tiroda (2-2-69).

**E. insulare** (Wittr.) Roy

In Vadali lake (9), Amravati (18-11-68). In Abkari lake (7.5), Bhandara (29-11-68). In a pond (8), Jawahar Nagar (12-1-69).

**E. irregulare** Gonz. et Gang.

In a puddle, Satnavri and in Vadali lake, Amravati (18-10-64). In pools near a dam, Pavnar (27-10-64).

**E. turneri** West

In Abkari lake (7.5), Bhandara (29-11-68).

**E. lutkemuelleri** Duc. v. **carniolicum** (Lutkem.) Krieger

In a pool, Mansar (13-12-64).

**E. platycerum** Reinsch

In a pond, Umred (30-11-64). In Abkari lake (7.5), Bhandara (29-11-68). In Sarkari lake (7.2), Tumsar (22-12-68).

**E. spinulosum** Delp.

Common in Vadali lake, Amravati (18-10-64, 3-3-65, 18-11-68). In a pond, Umred (30-11-64). In puddles, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (29-11-68). In Nave lake (8), Sakoli (5-1-69). In a pond (8), Jawahar Nagar (12-1-69). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**E. spinulosum** Delp. v. **bellum** Scott et Prescott

In a pond (8), Jawahar Nagar (12-1-69).

**E. subamoenum** Schmidle

In Abkari lake (7.5), Bhandara (28-12-68).

**E. sublobatum** Breb.

In Vadali lake, Amravati (3-3-65).

**E. sublobatum** Breb. v. **obtusatum** (Gutw.) Krieger

In ponds, puddles, Mansar (13-12-64). In Vadali lake, Amravati (3-3-65).

**E. turneri** West

In Abkari lake (7.5), Bhandara (9-11-68).

**Micrasterias crux-melitensis**

(Ehrenb.) Hass.

In Sarkari lake (7.2), Tumsar (22-12-68).

**M. foliacea** Bailey

In ponds, Umred (30-11-64), Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**M. mahabuleshwariensis** Hobs. v.

**chauliodon** Scott et Prescott

Very rare. In a pond, Mansar (13-12-64).

**M. pinnatifida** (Kuetz.) Ralfs

In ponds, Umred (30-11-64). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (28-12-68).

**M. pinnatifida** (Kuetz.) Ralfs v. **pseudoscitans** Gronbl.

In Sarkari lake (7.2), Tumsar (22-12-68).

**M. radians** Turn.

In ponds, Umred (30-11-64), Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-11-68).

**M. zeylanica** Fritsch

In a pond, Umred (30-11-64). In Abkari lake (7.5), Bhandara (28-12-68).

**M. zeylanica** Fritsch v. **rectangularis** Scott et Prescott .

In Abkari lake (7.5), Bhandara (28-12-68).

**Xanthidium antilopaeum** (Breb.)

Kuetz. v. **canadense** Joshua

In a pond, Mansar (13-12-64).

The present alga is smaller than the type—30-34  $\mu$  broad, 40-44  $\mu$  long, isthmus 20-21  $\mu$  broad.

**X. antilopaeum** (Breb.) Kuetz. v.

**hebridarum** West et West

In a pond, Mansar (13-12-64).

**X. burkillii** West et West v. **alternans** Skuja

In a pond, Mansar (13-12-64).

**X. hastiferum** Turn.

In a pond, Mansar (13-12-64).

**Arthrodesmus convergens** Ehrenb.

In ponds, Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

Zygotes are present in Mansar alga. They are spherical to ellipsoidal with smooth, thick outer wall, 29-31  $\mu$  in diameter, 30-34  $\mu$  long.

**A. curvatus** Turn.

In a pond, Mansar (13-12-64).

**A. curvatus** Turn. v. **latus** Scott et Prescott

In a pond, Umred (30-11-64). In Nave lake (8), Sakoli (5-1-69).

**Staurastrum anatinum** Cooke et

Wille v. **curtum** Smith

In a Gaon lake (7.2), Sakoli (5-1-69).

**S. arcuatum** Nordst.

In a pond, Mansar (13-12-64).

**S. brebissonii** Arch. v. **truncatum** Gronbl.

In Abkari lake (7.5), Bhandara (28-12-68).

**S. brevispinum** Breb. v. **retusum**

Smith

In Vadali lake, Amravati (18-10-64).

**S. dejectum** Breb.

In ponds, Umred (30-11-64), Mansar (13-12-64). In Abkari lake (7.5), Bhandara (28-12-68).

**S. dickiei** Ralfs

In a pond, Mansar (13-12-64).

**S. gladiusum** Turn.

In a pond, Umred (30-11-64).

**S. gracile** Ralfs

In Ramsagar lake (7.2), Tiroda (2-2-69).

**S. hantzii** Reinsch v. **japonicum**

Roy et Bisset

In a pond, Mansar (13-12-64).

**S. indentatum** West et West f. **minus**

Scott et Prescott

In a pond, Umred (13-12-64).

**S. iotanium** Wolle v. **longatus** Hirano

In a pond, Mansar (13-12-64).

**S. iotanium** Wolle v. **tortum** Teiling

In Vadali lake, Amravati (3-3-65). In Ramsagar lake (7.2), Tiroda (2-2-69).

**S. leptodermum** Lund v. **capitatum** Hirano

In ponds, Mansar (13-12-64).

**S. longispinum** (Bail.) Arch. v.**bidetatum** (Wittr.) West

In a pond, Mansar (13-12-64).

**S. megacanthum** Lund

In a pond, Mansar (13-12-64).

**S. orbiculare** Ralfs

In the scum on the submerged stones in Kapsi lake (8.2), Akola (16-10-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**S. orbiculare** Ralfs. v. **depressum**

Roy et Bisset

In Vadali lake, Amravati (18-10-64). In Nave lake (9.5), Bhandara (19-1-69).

**S. orbiculare** Ralfs v. **ralfsii** West

et West

In Sarkari lake (7.2), Tumsar (22-12-68).

**S. perundulatum** Gronbl.

In the scum on the submerged stones in Kapsi lake (8.2), Akola (16-10-68).

**S. pinnatum** Turn. v. **subpinnatum**(Schm.) West et West f. **robustum**

Krieg.

In a pond, Umred (30-11-64).

**S. polymorphum** Breb. v. **pygmaeum** Gronbl.

In Abkari lake (7.5), Bhandara (28-12-68).

**S. punctulatum** Breb.

In puddles, Umred (30-11-64). In Vadali lake, Amravati (3-3-65).

**S. quadricornutum** Roy et Bisset

Rare. In Vadali lake, Amravati (3-3-65).

**S. retusum** Turn. v. **boreale** West et West

In Vadali lake, Amravati (3-3-65).

**S. saltans** Josh. v. **javanicum** Scott et Prescott

In a pool, Umred, (30-11-64).

**S. sexangulare** (Bulnh.) Lund

In a pond, Umred (30-11-64).

**S. sexangulare** (Bulnh.) Lund v. **crassum** Turn.

In a pond, Umred (30-11-64).

**S. tohopekaligense** Wolle

In a pool, Mansar (13-12-64).

**S. tohopekaligense** Wolle v. **insigne** West et West

In puddles, Mansar (13-12-64).

**S. unguiferum** Turn.

In ponds, Umred (30-11-64), Mansar (13-12-64).

**Sphaerozosma punctatum** West et West

In a pond, Umred (30-11-64).

**S. vertebratum** (Breb.) Ralfs

In ponds, Umred (30-11-64).

**Spondylosium nitens** (Wall.) Arch. f. **majus** Turn.

In a pond, Umred (30-11-64).

**S. planum** (Wolle) West et West

In ponds, Umred (30-11-64), Mansar (13-12-64).

**Onychonema laeve** Nordst. v. **latum** West et West

In ponds, Umred (30-11-64), Mansar (13-12-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. laeve** Nordst. v. **micracanthum** Nordst.

In a pond, Umred (30-11-64).

- Hyalotheca dissiliens** (Smith) Breb.  
In Vadali lake, Amravati (3-3-65).
- H. indica** Turn.  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- H. mucosa** (Mert.) Ehrenb.  
In a pond, Umred (30-11-64).
- H. undulatum** Nordst.  
Rare. In Vadali lake, Amravati (13-12-64).
- Desmidium aptogonum** Breb.  
In Vadali lake, Amravati (3-3-65).
- D. aptogonum** Breb. v. **ehrenbergii** Kuetz.  
In paddy fields, Amravati (18-10-64). In Ramala lake, Chandrapur (1-11-64). In Nave lake (9.5), Bhandara (19-1-69).
- D. pseudostreptonema** West et West  
Common in ponds, Umred (30-11-64). In Ramsagar lake (7.2), Tiroda (2-2-69).  
Aplanospores are observed in material from Ramsagar lake. They are globose, 16  $\mu$  broad, with smooth wall.
- D. quadratum** Nordst.  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- Streptonema trilobatum** Wall.  
In ponds, Umred (30-11-64). In Ramsagar lake (7.2), Tiroda (2-2-69).  
Zygotes are observed in Ramsagar material. Zygotes are 33-35  $\mu$  broad, 50-53  $\mu$  long, ellipsoid in shape and with smooth walls.
- Mougeotia banglorensis** Iyengar  
In paddy fields, Vadali lake, Amravati (18-10-64).  
Aplanospores are also present.
- M. calcarea** (Cleve) Wittr.  
In a puddle, Amravati (18-10-64).
- M. floridana** Transeau  
In Kapsi lake (8.2), Akola (16-10-68).
- M. maltae** Skuja  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- M. microspora** Taft  
In a pond, Mansar (13-12-64).
- M. reinschii** Transeau  
In a pond, Amravati (18-10-64).
- M. sphaerocarpa** Wolle  
In Sarkari lake (7.2), Tumsar (22-12-68).
- M. transeau** Collins  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- Zygnema czurdae** Randhawa  
In Vadali lake, Amravati (18-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).
- Z. gangeticum** Rao  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- Z. globosum** Czurda  
In Vadali lake, Amravati (3-3-65).
- Zygnemopsis minuta** Randhawa  
In Vadali lake, Amravati (3-3-65).  
The present alga is provisionally kept here as the zygospores and azygospores differ from the type in having smooth walls and horned zygospores not observed.
- Z. sphaerospora** Randhawa  
In Abkari lake (7.5), Bhandara (29-12-68).  
Vegetative cells bigger—up to 21  $\mu$  broad, 150  $\mu$  long.
- Spirogyra azygospora** R. N. Singh  
In Khamb lake (8), Tiroda (2-2-69).
- S. bichromatophora** (Randhawa) Transeau  
In Kapsi lake (8.2), Akola (16-10-68).
- S. biformis** Jao  
In a pond, Wardha (12-3-68).  
Lateral conjugation only observed.
- S. corrugata** Transeau  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- S. diluta** Wood  
In a streamlet, Satnavri (18-10-64).
- S. fennica** Cedercreutz  
In Ramsagar lake (7.2), Tiroda (2-2-69).  
Chloroplast makes four turns.
- S. fuellebornei** Schmidle  
In a dam, Pavnar (27-10-64).
- S. smithii** Transeau  
In Zarpot stream, Chandrapur (1-11-65).
- S. weberi** Kuetz.  
In paddy fields, Amravati (18-10-64).



## EUGLENOPHYCEAE

- Euglena acus** Ehrenb.  
In bodhans, Chandrapur (1-11-65).  
In a pond, Umred (30-11-66).
- E. acus** Ehrenb. v. **hyalina** Klebs  
In a gutter, Khamgaon (13-10-67).
- E. acus** Ehrenb. v. **oyei** Defl.  
In a bodhan, Amravati (18-10-64).
- E. acus** Ehrenb. v. **rigida** Hubner  
In a foul smelling pool, Chandrapur (1-11-65).
- E. allorgei** Defl.  
In a bodhan, Akola (10-10-68).
- E. caudata** Hubner  
In a bodhan, Akola (18-10-68).
- E. charkowiensis** Swir.  
In a pool near a gutter, Chandrapur (1-11-65). In a bodhan, Akola (16-10-68). In Mendhe lake (9.5), Bhandara (19-1-69).
- E. charkowiensis** Swir. v. **minor** Skovortz.  
In Zarpat stream, Chandrapur (1-11-65).
- E. chortes** Schiller  
In a pond, Umred (30-11-64). In Nursery pond (8), Bhandara (28-12-68).
- E. gaumeri** Allorge et Lefevre  
In a bodhan, Amravati (18-10-64).
- E. gracilis** Klebs  
In a bodhan, Umred (30-11-64). In a pool, Khamgaon (13-10-67).
- E. ignobilis** L. P. Johnson  
In a bodhan, Akola (16-10-68).
- E. limnophila** Lemm.  
In a pool, Satnavri (18-10-64).
- E. mucifera** Mainx  
In a pond, Umred (30-11-64).
- E. multiformis** Schiller  
In a bodhan (8.4), Akola (16-10-68).
- E. oxyuris** Schmarda  
In a pond, Umred (30-11-64). In a gutter, Khamgaon (13-10-67).
- E. pusilla** Playfair  
In a pond, Umred (30-11-64).
- E. spirogyra** Ehrenb.  
In a pond, Umred (30-11-64).
- E. spirogyra** Ehrenb. v. **suprema** Skuja  
In a puddle, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68).
- E. tripteris** (Duj.) Klebs  
In a puddle, Umred (30-11-64).
- Phacus acuminatus** Stokes v. **indica** (Pochm.) Huber-Pestalozzi  
In a bodhan, Amravati (18-10-64). In a pool, Umred (30-11-64).
- P. acuminatus** Stokes v. **variabilis** Lemm.  
In bodhans, Amravati (18-10-64). Umred (30-11-64), Mansar (13-12-64).
- P. angulatus** Pochm.  
In Nursery pond (8), Bhandara (28-12-68).
- P. caudatus** Hubner  
In a pond, Umred (30-11-64).
- P. circumflexus** Pochm.  
In a pond, Umred (30-11-64).
- P. contortus** Bourr.  
In a puddle, Umred (30-11-64).
- P. curvicauda** Swir.  
In bodhans, Amravati (18-10-64), Wardha (27-10-64), Umred (30-11-68).
- P. sphippion** Pochm.  
In Ramala lake, Chandrapur (1-11-65).
- P. longicauda** (E.) Duj. v. **major** Swirengo  
In a pool, Umred (30-11-64).
- P. longicauda** (E.) Duj. v. **rotunda** (Pochm.) Huber-Pestal.  
In bodhans, Amravati (18-10-64), Chandrapur (1-11-64), Akola (16-10-68). In Ramala lake, Chandrapur (11-10-68). In Sarkari lake (7.2), Tumsar (22-12-68).
- P. mangini** Lef.  
In a bodhan, Akola (16-10-68).
- P. minutus** (Playf.) Pochm.  
In a pool, Satnavri (18-10-64). In Khamb lake (9), Bhandara (28-12-68).
- P. orbicularis** Hubn.  
In a pond, Umred (30-11-64). In Januna lake (8.2), Khamgaon (13-10-67). In Mendhe lake (9.5), Bhandara (19-1-69).

**P. pekinensis** Skvortz.

In Januna lake (8.2), Khamgaon (13-10-67).

**P. platalea** Drez.

In bodhans, Amravati (18-10-64), Umred (30-11-64), Mansar (13-12-64), Akola (16-10-68), Bhandara (22-12-68). In Nursery pond (8), Bhandara (28-12-68).

**P. pleuronectes** (O.F.M.) Duj.

In Motha lake, Umred (30-11-64).

**P. pseudonordstedtii** Pochm.

In a puddle, Umred (30-11-64).

**P. stokesii** Lemm. f. *minor* Conrad

In a pond, Wardha (27-10-64).

**P. swirenkoi** Ekvortz.

In a pool, Wardha (27-10-64).

**P. thrombus** Pochm.

In a pool, Umred (30-11-64).

**P. tortus** (Lemm.) Skv.

In a bodhan, Amravati (18-10-64). In Nursery pond (8), Bhandara (28-12-68).

**Trachelomonas allia** Drez. em. Defl.

In a streamlet, Satnavri (18-10-64). In a pond, Umred (30-11-64). In Mendhe lake (9.5), Bhandara (19-1-69).

**T. armata** (E.) Stein

In a pond, Umred (30-11-64).

**T. armata** (E.) Stein v. *longispina* Playf.

In a puddle, Umred (30-11-64).

**T. armata** (E.) Stein v. *steinii* Lemm. em. Defl.

In Vadali lake, Amravati (18-10-64). In a streamlet, Satnavri (6-12-64). In a puddle, Mansar (13-12-64). In Nursery pond (8), Bhandara (28-12-68).

**T. bacillifera** Playf.

In a bodhan, Chandrapur (1-11-65).

**T. bacillifera** Playf. v. *minima* Playf.

In Abkari lake (7.5), Bhandara (29-12-68). In Mendhe lake (9.5), Bhandara (19-1-69).

**T. bernardinensis** W. Vischer em. Defl.

In a bodhan, Akola (16-10-68). Tests bigger—22 to 26  $\mu$  broad, 55 to 58  $\mu$  long.

**T. conica** Playf.

In Ramala lake, Chandrapur (1-11-64).

**T. cylindrica** E. sec. Playf. v. *decolata* Playf.

In a bodhan, Amravati (18-10-64).

**T. dubia** Swir. em. Defl. v. *lata* Defl.

In a puddle, Mansar (13-12-64).

**T. dybowskii** Drez.

In a pond (8.5), Bhandara Road (19-1-69).

**T. globularis** Lemm. (Awer.) v. *boyeri* (Palmer) Conr.

In a pond, Mansar (13-12-64). In Abkari lake (7.5), Bhandara (28-12-68).

**T. hispida** (Perty) Stein em. Defl.

In paddy fields, Amravati (18-10-64). In Vadali lake, Amravati (18-10-64, 3-3-65). In bodhans, Chanda (1-11-64), Umred (30-11-64), Mansar (13-12-64), Malegaon (16-10-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Abkari lake (7.5), Bhandara (29-12-68). In Mendhe lake (9.5), Bhandara (19-1-69).

**T. hispida** (Perty) Stein em. Defl. f. *recta* Defl.

In Abkari lake (7.5), Bhandara (29-12-68).

**T. hispida** (Perty) Stein em. Defl. v. *coronata* Lemm.

In paddy fields, Amravati (18-10-64).

**T. incertissima** Defl.

In bodhans, Amravati (18-10-64). In Vadali lake, Amravati (3-3-65).

**T. intermedia** Dangeard

In a pond, Mansar (13-12-64). In a pond (8.5), Bhandara Road (19-1-69).

**T. klebsii** (Klebs) Defl.

In Vadali lake, Amravati (3-3-65). In bodhans, Akola (10-10-68). In Khamb lake (9), Bhandara (28-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**T. lacustris** Drez.

In a bodhan, Malegaon (11-10-68). In Sarkari lake (7.2), Tumsar (22-12-68).

**T. mangini** Defl.

In Nursery pond (8), Bhandara (28-12-68).

**T. mucosa** Swir. v. *hyalina* Skv.

In a bodhan, Chandrapur (1-11-65).

**T. oblonga** Lemm.

In a bodhan, Akola (16-10-68). In a pool, Malegaon (20-10-68). In a bodhan, Mansar (20-11-68). In Khamb lake (9), Bhandara (28-12-68). In a pond (8.5), Bhandara Road (19-1-69).

**T. oblonga** Lemm. v. *australica* Playf.

In a bodhan, Chandrapur (1-11-64). In a pond, Mansar (13-12-64).

**T. oblonga** Lemm. v. *major* Kamat

In a pond, Umred (30-11-64).

**T. oblonga** Lemm. v. *truncata* Lemm.

In a bodhan, Warora (2-11-65). In a pond, Mansar (12-11-67).

**T. obtusa** Palmer

In a pond, Umred (30-11-64).

**T. perforata** Awering

In Nursery pond (8), Bhandara (28-12-68).

**T. piscatoris** (Fischer) Stokes

In a bodhan, Chandrapur (1-11-65.)

**T. playfairi** Defl.

In ponds, Umred (30-11-64).

**T. pulcherrima** Playf. v. *minor* Playf.

In a bodhan, Amravati (18-10-64). In a pond, Mansar (13-12-64).

**T. raciborskii** Wolosz.

In Abkari lake (7.5), Bhandara (19-12-68).

**T. robusta** Swir. em. Defl.

In Mendhe lake (9.5), Bhandara (19-1-69).

**T. scabra** Playf.

In a bodhan, Amravati (18-10-65).

**T. scabra** Playf. v. *ovata* Playf.

In bodhans, Amravati (18-10-64).

**T. similis** Stokes

In Nursery pond (8), Bhandara (28-12-68).

**T. superba** Swir. em. Defl.

In Sarkari lake (7.2), Tumsar (22-12-68).

**T. sydneyensis** Playf.

In Abkari lake (7.5), Bhandara (29-12-68).

**T. varians** Defl.

In a pond, Umred (30-11-64). In Nursery pond (8), Bhandara (28-12-68).

**T. volvocina** Ehrenb.

In bodhans, Amravati (18-10-64), Wardha (22-10-64), Umred (30-11-64), Mansar (13-12-64), Chandrapur (1-11-65), Gondia (5-3-67), Khangaon (13-10-67). In Nursery pond (8), Bhandara (28-12-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Mendhe lake (9.5), Bhandara (19-1-69). In a pond (8.5), Bhandara Road (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**T. volvocina** Ehrenb. f. *minuta* Fritsch

In a bodhan, Amravati (18-10-64).

**T. volvocina** Ehrenb. v. *derephora* Conrad

In a pond, Mansar (13-12-64). In Sarkari lake (7.2), Tumsar (22-12-68).

**T. volzii** Lemm. v. *cylindrica* Playf.

In a pond, Umred (30-11-64).

**T. volzii** Lemm. v. *pellucida* Playf.

In pools, Umred (30-11-64).

**T. wermelii** Skv.

In Nursery pond (8), Bhandara (28-12-68).

**T. woycickii** Koczwara v. *bombayensis* Kamat

In a pond, Mansar (13-12-64).

**T. woycickii** Koczwara v. *pusilla* Drez.

In a bodhan, Amravati (18-10-64).

**Strombomonas fluviatilis** (Lemm.) Defl.

In Nursery pond (8), Bhandara (28-12-68).

**S. maxima** (Skv.) Defl.

In a bodhan, Chandrapur (1-11-64).

**S. napiformis** (Playf.) Defl. v. *brevicollis* (Playf.) Defl.

In Nursery pond (8), Bhandara (28-12-68).

**S. ovalis** (Playf.) Defl.

In a bodhan, Chandrapur (1-11-65). Wall finely punctuate.

**S. urceolata** (Stokes) Defl.

In a bodhan, Amravati (3-3-65).

- Lepocinclis glabra** Drez. f. **minor**  
Prescott  
In a bodhan, Amravati (18-10-64).  
**L. marssonii** Lemm. em Conrad  
In Sarkari lake (7.2), Tumsar (22-

- 12-68).  
**Menoidium gracile** Playf.  
In a puddle, Umred (30-11-64).  
**Anisonema acus** Duj.  
In a pond, Mansar (13-12-64).

## XANTHOPHYCEAE

- Ophiocytium elongatum** West et  
West  
In a puddle, Umred (30-11-64).  
**Botrydium granulatum** (L.) Greville  
On the moist soil of a drying

- puddle, Satnavri (18-10-64). On moist  
soil near a pond, Gondia (5-3-67).  
On the moist soil of a drying pool,  
Sakoli (15-12-68).

## DINOPHYCEAE

- Cystodinium iners** Geitler  
In a pond, Mansar (13-12-64).  
**Massartia stigmatica** (Linden)  
Schiller  
In Vadali lake, Amravati (3-3-65).  
In Ramsagar lake (7.2), Tiroda (2-2-  
69).  
**Gymnodinium neglectum** (Schill.)  
Lind.  
In a puddle, Mansar (13-12-64).  
**G. rotundum** Klebs  
Planktonic in Khamb lake (9),  
Bhandara (28-12-68).  
**Glenodinium gymnodinium** Penard  
Planktonic in a pond (8.2), Katol  
(24-11-68).

- G. quadridens** (Stein.) Schiller  
Planktonic in Khamb lake (8),  
Tiroda (2-2-69).  
**Peridinium bipes** Stein  
In Sarkari lake (7.2), Tumsar (22-  
12-68).  
**P. cinctum** (Muell.) Ehrenb.  
In Ramala lake, Chandrapur (1-11-  
65).  
**P. palustre** (Lindem.) Lef. v. **racibor-  
skii** (Wol.) Lef.  
In Abkari lake (7.2), Bhandara  
(29-11-68).  
**P. penardiforme** Lindem.  
In Ramsagar lake (7.2), Tiroda (2-  
2-69).  
**P. pusillum** (Penard) Lemm.  
In a cement cistern, Amravati (18-  
10-64).

## CYANOPHYCEAE

- Microcystis aeruginosa** Kuetz.  
Planktonic in a pond (9.2), Tum-  
sar (22-12-68). In Nursery pond (8),  
Bhandara (28-12-68). In Khamb lake  
(8.5), Tiroda (2-2-69).  
**M. flos-aquae** (Wittr.) Kirchn.  
Planktonic in ponds, Gondia (5-3-  
67), Mehkar (20-10-68), Tumsar (22-  
12-68).  
**Aphanocapsa grevillei** (Hass.)  
Rabenh.  
On stones in pools, Satnavri (18-  
10-64). On submerged soil at the  
shore of Vena dam (1-2-69).

- A. testacea** Naeg.  
In Ramsagar lake (7.2), Tiroda (2-  
2-69).  
The alga is free floating and the  
cells are spherical and never ellip-  
soid as in the type.  
**Aphanothece castagnei** (Breb.)  
Rabenh.  
In cement cisterns, Khamgaon (13-  
10-68). In Nave lake (9.5), Bhandara  
(28-12-68).  
**A. heterospora** Rabenh.  
In Ramsagar lake (7.5), Tiroda (2-  
2-69).

**A. microscopica** Naeg.

Adhering to sides of cement cisterns, Amravati (18-10-64). In Ramala lake, Chandrapur (1-11-64). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

**A. pallida** (Kuetz.) Rabenh.

In Vadali lake and on moist soil, Amravati (18-10-64). In paddy fields, Umred (30-11-64). On moist soil and in ponds, Mansar (13-12-64). On moist soil in a garden, Chandrapur (1-11-65). On moist soil and in cement cisterns, Khamgaon (13-10-67). On moist soil of a drying pool, Akola (16-10-68). In Nave lake (9.5), Bhandara (19-1-69). In Ramsagar lake (7.2), Tiroda (2-2-69).

Firm, globular to elongate, yellowish mucilaginous masses, 3-8 cm broad, were present in large numbers in paddy fields in Umred.

In some collections, cells with sheaths—*Gloeotheca* like cells were present.

**Gloeocapsa muralis** Kuetz.

Adhering to the sides of a cement cistern, Amravati (18-10-68).

**Gloeotheca geoppertiana** (Hilse)

Forti

In a cement water passage, Wardha (12-3-68).

**G. rupestris** (Lyngby.) Born.

In a pool, Khamgaon (13-10-67).

**G. samoensis** Wille

In a cement cistern, Amravati (18-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**Chroococcus minor** (Kuetz.) Naeg.

In cement cisterns, Amravati (18-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. minutus** (Kuetz.) Naeg.

In a streamlet, Satnavri (18-10-64). In pools, puddles, Wardha (27-10-64), Khamgaon (13-10-67).

**C. minutus** (Kuetz.) Naeg. v. **obliteratus** (Richt.) Hansg.

In the scum on the stones submerged in Kapsi lake (8.2), Akola (16-10-68).

**C. pallidus** Naeg.

In a puddle, Wardha (27-10-64).

**C. spelaeus** Ercegovic

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. turgidus** (Kuetz.) Naeg.

In a pond, Wardha (27-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. turgidus** (Kuetz.) Naeg. v. **maximus** Nygaard

In Ramsagar lake (7.2), Tiroda (2-2-69).

**C. turicensis** (Naeg.) Hansg.

In cement cisterns, Amravati (18-10-64). In a lake (8.2), Dahegaon (27-12-64). In Januna lake (8.2), Khamgaon (13-10-67).

**C. westii** (W. West) Boye-Pet.

In a lake (8), Yeotmal (27-10-68). In Sarkari lake (7.2), Tumsar (22-12-68). In Nave lake (9.5), Bhandara (19-1-69).

**Merismopedia elegans** A. Br.

In puddles, Wardha (27-10-64), Mehkar (20-10-68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**M. glauca** (Ehrenb.) Naeg.

In a streamlet, Satnavri (18-10-64). In cement cisterns, Amravati (18-10-64), Wardha (27-10-64). In a pond (8.5), Jawahar Nagar (12-1-69). In a side pool of Vena dam (1-2-69). In Khamb lake (8.5), Tiroda (2-2-69).

**M. punctata** Meyen

In a dam, Pavnar (27-10-64). In Zarpal stream, Chandrapur (1-11-64). In a pond, Wardha (10-11-65). In Painganga river (8.2), Mehkar (20-10-68). In Nave lake (8), Sakoli (15-12-68).

**M. tenuissima** Lemm.

In cement cisterns, Amravati (18-10-64).

Colonies usually consisting of 4-8 cells. Cells broader—up to 3  $\mu$  broad. **Synechococcus cedrorum** Sauv.

In cement cisterns, Amravati (18-10-64).

**S. aquatilis** Sauv.

In a pool, Amravati (18-10-64).

**S. crassa** Woronic.

In a cement cistern, Amravati (18-10-64).

- S. sallensis** Skuja  
In a cement cistern, Amravati (18-10-64).
- Myxosarcina burmensis** Skuja  
In Abkari lake (7.5), Bhandara (28-12-68). In Ramsagar lake (7.2), Tiroda (2-2-69).
- M. spectabilis** Geitler  
In a pond, Umred (30-11-64).
- Chamaesiphon sideriphilus** Starm. v. **glabra** C. B. Rao  
In a lake (8), Yeotmal (24-11-68).  
Calcium impregnation is not present.
- Borzia trilocularis** Cohn  
In cement cisterns, Amravati (18-10-64), Khamgaon (13-10-67).
- Spirulina major** Kuetz. ex Gomont  
In Vadali lake, Amravati (18-10-64). In a pool, Satnavri (18-10-64). In Pavnar dam (27-10-64). In a puddle and in a gutter, Wardha (27-10-64). In Ramala lake, in a pool and in a bodhan, Chandrapur (1-11-64). In a pond, Gondia (5-3-67). In a lake (11), Lonar (24-10-68). In Zarpur stream, Chandrapur (12-10-69). In a lake (8), Yeotmal (24-11-68). In Khamb lake (8.5), Tiroda (2-2-69).
- S. meneghiniana** Zanard  
In a pond, Wardha (27-10-64). In a lake (11), Lonar (24-10-68).
- S. princeps** West et West  
In Sarkari lake (7.2), Tumsar (22-12-68).
- S. subsalsa** Oerst.  
In a rock pool, Wardha (27-10-64).
- S. subsalsa** Oerst. v. **crassior** Virieux  
In a lake (11), Lonar (24-10-68).  
Spirals up to 4  $\mu$  broad only.
- Arthrospira platensis** (Nordst.) Gomont  
In a lake (8), Yeotmal (24-11-68).
- A. tenuis** Bruhl et Biswas  
In a bodhan, Amravati (18-10-64).  
Trichomes usually much longer, with 10 spirals.
- Oscillatoria agardhii** Gom.  
In a pond, Gondia (5-3-67).
- O. amphibia** Ag. ex Gom.  
In a dirty water passage, Wardha (27-10-64). In ponds, Mansar (13-12-64), Gondia (5-3-67), Tumsar (22-12-68). At the shore of a lake (11), Lonar (24-10-68).
- O. angusta** Koppe  
In a streamlet, Satnavri (18-10-64).
- O. annae** van Goor  
In a puddle, Wardha (27-10-64).
- O. boryana** Bory ex Gom.  
In a lake (8), Yeotmal (24-11-68).
- O. brevis** (Kuetz.) Gom.  
In gutters and side pools, Akola (16-10-68), Khamgaon (13-10-67). In Ramsagar lake (7.2), Tiroda (2-2-69).
- O. chalybea** (Mertens) Gom.  
In a pond, Amravati (18-10-64). In a pond (8), Akola (16-10-68). In a lake (11), Lonar (24-10-68).
- O. claricentrosa** Gardn.  
In the mucilaginous masses of other algae in a pond, Umred (30-11-64).
- O. cortiana** Menegh.  
In a gutter, Wardha (27-10-64).
- O. cortiana** Menegh. v. **minor** Kamat  
In a puddle, Chandrapur (1-11-65).
- O. decolorata** G. S. West  
In a pond, Umred (30-11-64).
- O. formosa** Bory ex Gom.  
In a cement cistern, Amravati (18-10-64).
- O. geminata** Menegh. ex Gom.  
In a lake (8.2), Katol (8-12-68).  
Trichomes narrower up to 2  $\mu$  broad.
- O. jatorvensis** Vouk  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- O. mougeotii** Kuetz.  
In a streamlet, Satnavri (18-10-64). In a pond and in gutters, Umred (30-11-64). In gutters, Akola (16-10-68), Karanja (17-10-68), Mehkar (22-10-68). In a lake (8), Yeotmal (24-11-68). In Sarkari lake (7.2), Tumsar (22-12-68).
- O. nigro-viridis** Thwaites  
On moist soil near a gutter, Wardha (12-3-68).
- O. okeni** Ag. ex Gom.  
In Pavnar dam (27-10-64). In a gutter and in Januna lake (8.2), Khamgaon (13-10-67). On the shore of a lake (11), Lonar (24-10-68). In a lake (8), Yeotmal (24-11-68). In

Sarkari lake (7.2), Tumsar (22-12-68).

**O. ornata** Kuetz. ex Gom. v. **crassa**  
C. B. Rao

In a pond, Wardha (27-10-64). In Zarpat stream, Chandrapur (1-11-64). In a pond, Gondia (5-3-67).

**O. princeps** Vauch.

In a rock pool, Wardha (27-10-64).

**O. proboscoidea** Gom.

In a bodhan, Satnavri (18-10-64). In a pool, Wardha (27-10-64).

**O. profunda** Kirchn.

In a pond, Gondia (5-3-67). On moist soil near Vena dam (1-2-69). In a road side puddle, Tiroda (2-2-69).

**O. pseudogeminata** G. Schmid

In a puddle, Amravati (18-10-64). In a streamlet, Satnavri (18-10-64).

**O. pseudogeminata** G. Schmid f. **longa** Kamat

In a pool, Satnavri (18-10-64). In Zarpat stream, Chandrapur (1-11-64). On moist soil near a pond and in Kapsi lake (8.2), Akola (16-10-68). In a lake (11), Lonar (24-10-68). In Khamb lake (8.5), Tiroda (2-2-69).

Occasionally the trichomes are broader—up to 2.8  $\mu$  broad.

**O. quadripunctulata** Bruhl et Biswas

Embedded in the mucilaginous masses of *Gloeotrichia* sp. in Gaon lake (7.2), Sakoli (5-1-69).

**O. quadripunctulata** Bruhl et Biswas v. **unigranulata** R. N. Singh

In a streamlet, Satnavri (18-10-64).

**O. quadripunctulata** Bruhl et Biswas v. **unigranulata** R. N. Singh. f. **ahmedabadensis** Kamat

In paddy fields, Umred (30-11-64). On the shore of Vena dam (1-2-69).

**O. raciborskii** Wolosz.

In Nursery pond (8), Bhandara (28-12-68).

Trichomes slightly broader—up to 10  $\mu$  broad.

**O. rubescens** D. C. ex Gomont

In gutters, Amravati (18-10-64), Umred (30-11-64), Akola (16-10-68), Mehkar (20-10-68), Yeotmal (24-11-

68). In Ramsagar lake (7.2), Tiroda (2-2-69).

**O. schultzei** Lemm. v. **cylindrica**  
Kamat

On moist soil near a pond, Wardha (27-10-64). In Zarpat stream, Chandrapur (1-11-64).

Trichomes slightly broader—up to 3.5  $\mu$  broad.

**O. simplicissima** Gom.

In Sarkari lake (7.2), Tumsar (22-12-68).

**O. splendida** Grev. ex Gom.

In a pool, Satnavri (18-10-64). In Gaon lake (7.2), Sakoli (7-1-69). In Ramsagar lake (7.2), and Belati pond (7.5), Tiroda (2-2-69).

Belati pond alga is broader—up to 3.6  $\mu$  broad.

**O. splendida** Grev. ex Gom. v.

**attenuata** West et West

On moist soil near Vena dam (1-2-69).

**O. subuliformis** Kuetz. ex Gom.

On drying soil near a lake (11), Lonar (24-10-68).

Trichomes broader—up to 7.5  $\mu$  broad.

**O. tambi** Woron.

In a bodhan, Amravati (18-10-64). In a lake (11), Lonar (24-10-68).

Amravati alga has slightly constricted trichomes while Lonar alga has narrower trichomes (–2.9  $\mu$  broad).

**O. tenuis** Ag. v. **tergestina** Rabenh.

In a lake (8), Yeotmal (24-11-68).

**O. ulrichii** Prat

Planktonic in a bodhan, Gondia (5-3-67).

**Phormidium corium** (Ag.) Gom.

In Vadali lake, Amravati (18-10-64). In a streamlet, Satnavri (18-10-64).

**P. crossbayanum** Tild.

On cement flooring near a water tap, Tiroda (2-2-69).

**P. foveolarum** Gom.

In Zarpat stream, Chandrapur (1-11-64).

**P. frigidum** Fritsch

On the sides of cement cisterns, Amravati (18-10-64).

**P. jenkelianum** G. Schmid

In a streamlet, Satnavri (18-10-64).

**P. molle** Gom.

In Vadali lake, Amravati (13-10-64). In a pool, Wardha (27-10-64).

**P. mucicola** Huber-Pest. et Naumann

Embedded in the mucilage of *Microcystis* colonies in Nursery pond (8), Bhandara (28-12-68), in a pond (9), Tumsar (22-12-68), in Khamb lake (8.5), Tiroda (2-2-69).

**P. stagnina** C. B. Rao

On dripping rocks, Chandrapur (1-11-64). Near a water tap, Wardha (2-3-68).

**Lyngbya allorgei** Frey v. **granulata** Kamat

On stones in a streamlet, Satnavri (18-10-64).

Filaments are narrower, 3-3.2  $\mu$  broad and the cells sometimes longer—up to 5  $\mu$  long.

**L. birgei** G. M. Smith

In Sarkari lake (7.2), Tumsar (22-12-68).

**L. confervoides** Ag.

Adhering to cement drain, Wardha (12-3-68).

**L. endophytica** Elenk. et Hollerb.

In mucilaginous masses of *Aphanothece* in paddy fields, Umred (30-11-64).

**L. gandhii** Kamat

In a fountain reservoir, Amravati (18-10-64).

**L. hieronymusii** Lemm.

In a pond, Umred (30-11-64).

**L. holsatica** Lemm.

Floating masses in a pond, Wardha (27-10-64).

**L. lachneri** (Zimm.) Geitler

In a cement cistern, Amravati (18-10-64). In a lake (8), Yeotmal (22-11-68). In Nave lake (9.5), Bhandara (19-1-69).

**L. lachneri** (Zimm.) Geitler v. **minor** Geitler

On cement flooring near a water tap, Tiroda (2-2-69).

**L. limnetica** Lemm.

In Ramsagar lake (7.2), Tiroda (2-2-69).

**L. majuscula** Harvey ex Gomont

In a streamlet, Satnavri (18-10-64). In Pavnar dam (27-10-64).

**L. martensiana** Menegh. ex Gomont

In a streamlet, Chandrapur (1-11-64).

Trichomes slightly narrower—up to 5.8-6  $\mu$  broad.

**L. shackletoni** West et West

On cement flooring near a water tap and in Ramsagar lake (7.2), Tiroda (2-2-69).

**L. spiralis** Geitler

In a bodhan, Satnavri (18-10-64).

**Microcoleus chthonoplastes** Thuret ex Gomont

On moist soil near Nave lake, Sakoli (5-1-69).

**Anabaenopsis arnoldii** Aptek. v.**indica** Ramnathan

Planktonic in a lake (11), Lonar (24-10-68).

Spores not observed.

**A. circularis** (G. S. West) Wolosz. et Miller

Planktonic in a puddle, Mehkar (20-10-68).

Heterocysts are conical and not spherical as in the type. Granules and/or gas-vacuoles are not observed.

**A. raciborskii** Wolosz.

Planktonic in ponds, Gondia (5-3-67), Mehkar (20-10-68).

Trichomes are slightly constricted in both the collections, which agree with the description given by Geitler (1932). Desikachary (1959) describes the trichomes as not constricted though his figure (Pl. 63, f. 7) shows slight constrictions at some cross walls.

**Raphidiopsis mediterranea** Skuja

Planktonic in ponds, Mansar (13-12-64), Gondia (5-7-67), Katol (8-12-68).

**Cylindrospermum licheniforme**

Kuetz. ex Born. et Flah.

In Vadali lake, Amravati (3-3-65).

**C. majus** Kuetzing ex Born. et Flah.

In paddy fields, Amravati (18-10-64).



- C. muscicola** Kuetz. ex Born. et Flah.  
In Nave lake (9.5), Bhandara (19-1-69).
- C. stagnale** (Kuetz.) Born. et Flah.  
In Vadali lake, Amravati (3-3-65).  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- Anabaena fuellebornii** Schmidle  
In Sarkari lake (7.2), Tumsar (23-12-68).
- A. inaequalis** (Kuetz.) Born. et Flah.  
In a pond, Umred (30-11-64).
- A. orientalis** Dixit  
In Sarkari lake (7.2), Tumsar (22-12-68).
- A. sphaerica** Born. et Flah.  
Planktonic in a puddle, Mehkar (20-10-68).
- A. volzii** Lemm.  
In paddy fields, Amravati (13-10-64). In a small pond, Wardha (27-10-64). In Ramsagar lake (7.2), Tiroda (2-2-69).
- Nodularia spumigena** Mertens  
In a lake (11), Lonar (24-10-68).
- Nostoc microscopium** Carm. ex Born. et Flah.  
In Nursery pond (8), Bhandara (28-12-68).  
Spores not observed.
- N. paludosum** Kuetz. ex Born. et Flah.  
In a pond, Umred (30-11-64). In Abkari lake (7.5), Bhandara (29-11-68).
- N. rivulare** Kuetz. ex Born. et Flah.  
In Gaon lake (7.2), Sakoli (5-1-69).
- Aulosira fertilissima** Ghose v. tenuis C. B. Rao  
In Vadali lake and in paddy fields, Amravati (18-10-64). In Kapsi lake (8.2), Akola (16-10-68).
- A. implexa** Born. et Flah. v. crassa Dixit  
In Vadali lake, Amravati (18-10-64). In a streamlet, Warora (30-10-65). In a pool, Chandrapur (1-11-65).
- Camptylonemopsis pulneyensis** Desik.  
In Sarkari lake (7.2), Tumsar (22-12-68).  
Filaments up to 16  $\mu$  broad; spores

are cylindric, 12-14  $\mu$  broad, 16-20  $\mu$  long, with smooth walls.

- Scytonema chiastum** Geitler  
In paddy fields, Amravati (18-10-64).
- S. cookei** W. et G. S. West  
On moist soil, Amravati (18-10-64).
- S. simplex** Bharadw.  
In Ramsagar lake (7.2), Tiroda (2-2-69).
- Forticia bossei** (Fremy) Desik.  
In a streamlet, Amravati (18-10-64; 20-11-68).  
Spores broader up to 6.5  $\mu$  broad, the shape of the spores also different being always rectangular, and not rounded at the angles.
- Calothrix clavatoides** Ghose  
Epiphytic on *Hydrilla* leaves in a cement cistern, Akola (6-3-69).
- C. epiphytica** West et West  
In Sarkari lake (7.2), Tumsar (22-12-68).
- C. karnatakensis** Gonz. et Kam. v. major Gonz. et Kam.  
Epiphytic on aquatic plants in Vadali lake, Amravati (3-3-65).
- C. marchica** Lemm.  
In Abkari lake (7.5), Bhandara (29-12-68).
- C. wembaerensis** Hieron et Schmidle  
In Sarkari lake (7.5), Tumsar (22-12-68).
- Dichothrix orsiniana** (Kuetz.) Born. et Flah.  
On dripping rocks, Amravati (18-10-64).
- Gloeotrichia intermedia** (Lemm.) Geitler v. kanwanensis C. B. Rao  
In Ramala lake, Chandrapur (1-11-64). In Abkari lake (7.5), Bhandara (29-12-68).
- G. natans** Rabenh. ex Born. et Flah.  
In Gaon lake (7.2), Sakoli (5-1-69).  
Cells and heterocysts are slightly broader.
- G. pilgeri** Schmidle  
Epiphytic on aquatic plants in ponds, Umred (30-11-64), Vadali lake, Amravati (18-10-64), Mansar (13-12-64), Nave lake (9.5), Bhandara (19-1-69).

**G. raciborskii** Wolosz.

Planktonic in Gaon lake (7.2).  
Sakoli (5-1-69).

**G. raciborskii** Wolosz. v. **kashiense**

C. B. Rao

In Vadali lake, Amravati (18-10-64).

**Hapalosiphon baronii** West et West

In a pond, Mansar (13-12-64).

**H. hibernicus** West et West

In a pond, Mansar (13-12-64).

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